**Follicular and luteal dynamics of the estrous cycle under tropical conditions in Caribbean-based donkeys**

R.L. Ambrosia, R.O. Gilbert, D.R. Bergfelt, J.C. Samper, E.W. Peterson, H.M. French
Ross University School of Veterinary Medicine, Saint Kitts and Nevis, West Indies

Eight non-pregnant, regularly cycling Nevisian Jennies were examined via transrectal ultrasound to define follicle dynamics and luteal function under tropical conditions. Daily palpation of each donkey took place over four consecutive ovulatory cycles to map and measure each follicle and subsequent corpus luteum. Estrous cyclicity and luteal function were confirmed from serum samples collected every other day and stored for progesterone determination. The mean (±SEM) inter-ovulatory interval across all donkeys and cycles was found to be 22.93 d (±1.99 d), and was repeatable within each donkey. This value was substantially shorter (by 2 and 3 days) than previously published data, which could be attributable to breed or global location. Follicles were retrospectively characterized into groups defined as small, medium, and large defined as average diameters ≤ 10 mm, 11 to 19 mm, and ≥ 20 mm, respectively. Once a follicle grew to > 30mm, the donkey was monitored via transrectal ultrasonography every 6 hours to more accurately determine the diameter of pre-ovulatory follicles until ovulation. Mean maximum follicular diameter was 34.63 mm (±2.91 mm), which was significantly different on paired t-test (P=0.029) from the immediate pre-ovulatory follicular diameter average of 34.11mm (±3.31mm). Both of these values were significantly correlated (P=0.0008 and 0.0023, respectively) to the inter-ovulatory interval for each donkey, indicating longer intervals were associated with larger sized follicle and pre-ovulatory follicles. When the largest follicle was isolated from each day, a two-wave pattern became evident with the first wave reaching maximum diameter (around 23-25mm) around day 7 or 8 post-ovulation, and the second wave of follicles ≥10mm emerged around day 14. The first wave was usually a minor wave (largest follicle <25mm) consistently in 6 out of the 8 donkeys. In regard to follicular dynamics, there was also a correlation between the total number of follicles present throughout a cycle, and serum progesterone levels (P=0.004). Jennies that had more total follicles had lower serum progesterone concentrations; while those that had fewer total numbers of follicles, had higher serum progesterone concentrations. Serum progesterone and luteal volume were also closely related (P<0.0001). Five days after ovulation, luteal tissue reached maximal volume (mean ≥ $8mm^3$) before falling gradually after day 15; while progesterone slowly climbed to its maximum serum concentration by days 9 to 10, but then declined precipitously around day 14 or 15. This suggests that steroidogenesis of a corpus luteum decreases much more rapidly than volume at the end of the luteal phase. This study helped clarify and define normal estrous cycle characteristics, which in turn can be utilized in population-control efforts that are ongoing throughout the Caribbean Islands. Future research into other reproductive characteristics will better define specific differences between breeds of donkeys or areas of the globe for use with either population management or improving reproductive techniques.

**Keywords:** Jenny, inter-ovulatory interval, follicle, progesterone, corpus luteum, Caribbean